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Open source learning streams in online discussions in e-learning

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Abstract:

The wish for a more engaging e-learning design and better utilization of the technology at hand has led to the pedagogic design in this study. We wanted to make a strong alternative to face-to-face teaching that was just as likely to facilitate learning as face to face teacher presentations and class discussions. The study investigates how online discussions in connection with teacher produced video presentations can generate an 'open source learning stream' in an e-learning course for teachers. We look at how an 'open source learning stream' can encourage students to give and receive peer feedback. We propose the idea that if learning in an online community is set up to follow the lines of identity building in social media (Larsen 2007) then we might get a natural momentum in the 'open source learning stream'. We try to identify demographic factors that could influence the success of the 'open source learning stream'. We found that some students in the demographic group that used computers in their childhood experience that they can learn more form video clips and online discussion than from traditional teacher presentations and face to face discussions. We also found that the demographic group that didn't use computers in their childhood believes that they learn more for traditional face-to-face teaching. This divergence in belief calls for a better defined demographic categorization of the students before dividing them into groups in e-learning. The categorization might assist the diffusion of innovation in the persuasion stage (Rogers 2010) of the implementation of the new pedagogic design so that peers would persuade each other that they can adopt the new learning practices and participate in the 'open source learning stream'. We propose the idea that significant demographic knowledge of the students in combination with learning analytics can generate a strong e-learning design. Furthermore we investigate inclusion/exclusion mechanisms in the pedagogic design and we found that a more rapid and multimodal type of reply would help some students. The study presents a critical realist analysis of the pedagogic design in question and tries to abduct a categorization of student demographics' influence on learning progression and on the utilization of web-tools at hand in the students' learning process.

Keywords: 'open source learning stream', online discussions, teacher produced video, deep learning, etivities,

1.0 Introduction:

The notion of the 'open source learning stream' (OSLS) tries to bring new ideas to the field of e-learning. Not in terms of technology application but in terms of creating consciousness of the students learning process in a common learning stream. The study investigates the possibilities of co-creation of learning processes and which circumstances might catalyze deep learning (Entwistle, Waterston 1988) in an OSLS. The individual learning process is normally supported by teachers who organize learning activities and materials. But in an OSLS the learners needs the competence to seek out and select a part of the learning activities and materials themselves. It seems that the fruitfulness of the OSLS depends on the participants' ability and willingness to go into the other participants' academic problems, challenges and lack of digital study skills. This raises questions such as; what does it take to create a fruitful OSLS? Which demographic group of students is more likely to benefit from this pedagogic design? Could the pedagogic design be adaptive in relation to leaner needs without it being resource consuming and complicated for both teacher and student?

2.0 Context of the research

The course is a three semester e-learning course for kindergarten teachers. Each semester is constituted by a two-day presence, introductory seminar and a three month e-learning course

followed by an exam. The course is attended by 10 (of which 9 took exams) students. The general pedagogic idea is to use video in connection with collaborative LMS functions to generate an open source learning stream. An open source learning stream (OSLS) is described as a synchronous, collaborative, learning process, where all learners contribute to the common learning goal (Kjaergaard & Sorensen 2014). The study investigates whether personalized video presentations and online discussions can make it out for classroom teaching and discussions. The course is designed on the basis of e-tivities (Salmon 2013). The course is also designed to catalyze deep learning (Entwistle, Waterston 1988) by making the learning goals and the processes very visible, relevant and obtainable (Hattie 2013) (Biggs, Tang 2011). The assumption is that the phatic value of the video presentation would enhance the students' learning (Ebner, Lienhardt et al. 2010). The course is designed as e-learning because the subject of the course is rather narrow scoped, hence not attracting enough students in the local area of Aalborg. It is also designed as e-learning because the students are already working as teachers, which means that they don't have time to attend classes during the day.

2.1 Philosophy of science

The approach to knowledge and reasoning in this study is critical realist (Bhaskar 2008). This implies that we work under the assumption that there is an interaction between ontology and epistemology. Critical realism is a philosophical movement that is probably most used in social science (Sayer 1992, Danermark 2002) but in recent studies it seems to become more and more used in education research (Scott 2005, Clegg 2005, Kontos, Poland 2009, Archer, Bhaskar et al. 2013, Scott 2013). It is a useful approach in research on innovative development. The learning process is seen as an emergence constituted by causal mechanisms. In the type of educational research we conduct in this study the object is made up of representation of causal mechanisms which could be seen as a specific student behavior, a better grade, stronger cooperation, indicators of learning etc. There are two general approaches to reasoning in this study; one where we abduct a pedagogical design on the basis of our practical experience and theoretical knowledge (abduction) and one where we retrospectively investigate why the pedagogical design work or don't work (retroduction) (Chiasson 2005). These two approaches to reasoning stem from the philosophy of pragmatism (Peirce 1998). In Peirce's 'Theory of Truth' he claims that 'truth' is what an ideal collegium of researchers will agree on over time, which is very pragmatic. That pragmatic 'truth' resembles Foucault's 'regime of truth' (Cummins 2003) in the sense that what knowledge and policy makers agree on is claimed to be 'true'. The 'pragmatic truth' is more closely related to the actual context, where the 'regime of truth' is more likely to reveal itself as a power structure. In this study we claim that both these 'truths' (the pragmatic truth and the regime om truth) are in a constant fluctuating interaction with technology and related, applied techniques and that the pragmatic 'truths' are not always in line with rationales of the context. 'The regime of truth' is an exterior enforcement mechanism (Foucault 2008) that has an imposing influence on the individual whereas the 'pragmatic truth' can be seen as an internal enforcement mechanism that the individual influences himself. In other words there is a conflict between global understanding of a phenomenon and local practice with the noumenon in a Kantian way. In this case the pedagogic 'regime of truth' embodies the notion that we need to be together physically for the 'best' teaching to take place, however, the 'pragmatic truth' of our experience implies that efficient learning can happen in many other pedagogical contexts. This 'regime of truth' insisting on physical presence does not only seem to be dominating amongst fellow teachers, it also dominates the students preconception of which circumstances they need to learn. Learner needs can be divided into 'natural needs' and 'socially constructed needs' (Ayers 2011). So, what the learner (and teacher) believes to be an absolute need in the learning process might be a socially constructed need that can be changed by exposing the learner to other types of practices. In this study we have tried to abduct a pedagogical design that contains very little of what the learners think they need in order to learn and a lot of new practices. The retroductive analysis will show what made the learners change their mind on what they thought they needed in order to learn.
The activities leading to learning are partly constructed through the way we describe them and partly through the limits and possibilities of the technology. That means that the object of research exists

outside of our consciousness but we can influence it through language and action. In critical realism stratification is one of the methods to understand the research object. According to critical realism (Archer, Bhaskar et al. 2013) the world consists of a transitive level and an intransitive level. Knowledge is a social object in the transitive level and it exists independent of whether we know of it or not, and knowledge will interact with the world in its own social causality (Bhaskar 2009). We have knowledge of something but knowledge cannot be reduced to what it is about because knowledge it in itself is a causal mechanism. In this context this means that the learning process and the conversation in the online discussion exists without the predicative of it being an OSLS, but the OSLS predicative is also influencing the way the discussion is conducted because OSLS defines a specific online communication genre. So there is an interaction between the object and knowledge of the object. So by the means of abduction we design the genre OSLS and then we implement the notion of the OSLS in a practical learning context. After that we look at the OSLS retrocuctively using a variety of approaches to reasoning to extract the interesting causal mechanisms. When we extract and isolate the causal mechanisms we can interpret why the causal mechanisms had the effect they had and how the context influenced these causal mechanisms.

3. 0 Methodology

The methodological approach to this study is, to some extent, design based research. The provisos being that the study is not iterative (yet), nor is it carried out in longevity (yet). It is however an attempt to bring theory and practice together in a new pedagogical design that aims to overcome real-live challenges and make real changes to the field of study (Herrington, McKenney et al. 2007).Furthermore we, as researchers, are deeply involved in the design process but not in the teaching which makes our methodology differ from action research.

The first step was to design the course. The design process was primarily done by us, the researchers, but with interaction from the teachers that should teach the course. After the design process we held a series of workshops where the teachers teaching the course got familiarized with the theoretical and practical parts of the design. They experimented with making their own educational videos and with online discussion. These first videos should be used for the first etivities in the introductory seminar. This meant that the teacher were very motivated to learn how to make the videos and that the content and aesthetics of the videos should be authentic and of good quality. The teachers saw the workshops as a preliminary part of their preparation for course.

The second step was to establish and implement a new ‘pragmatic truth’ of learning amongst the students. We planned a two-day, physical presence, introductory seminar where we presented the pedagogical design. This was done through reel, curricular exercises, so that the students could focus on the subject and their learning process and not be alienated by new techniques and technology. We helped and supervised a lot on the techniques and technology during the introduction course which made the students feel confident that they could manage the technical part of the learning process on their own when the actual course started.

The third step was to observe and analyze the discussions in the online forum and to retrieve data through qualitative and quantitative questions in a questionnaire.

4.0 Data analysis

During the introductory seminar we observed the students as they engaged in pilot-etivities. The focal points of the observation were to assess how much time they spend learning the techniques and how much time they spend learning the subject matter. This initial observation showed us that even the slightest technical problem could jeopardize the whole learning process. We thought that the design was simple, but we had to make it even simpler and we had to incorporate redundant solutions (to have both links to video and embedded video etc.). While observing the students we saw that they didn’t consult one another on technical matters and they didn’t try to solve the problems themselves

instead they waited for help from the teachers. This observation made us a bit anxious as to whether the students would be able to learn from the pedagogical design or if they would get tied up in technical matters. We discussed if we should make a technical help forum where the students could get help on technical issues. This solution is known to help in other cases (Salmon 2012), however, we decided not to create one such in this case because the students were unfamiliar with online discussions in general and they were not used to expressing their problems in written form, furthermore it would be difficult for some to describe their problems. In addition to that an online discussion forum does not necessarily give the instant reply that a student in acute need needs. So, one of the things that the initial observations showed was that the pedagogic design lacked a support function. Data was also generated through surveys. These surveys contained both closed and open ended questions. The closed ended questions gave us quantitative answers that seemed appropriate for generalization but the population of the survey was way too little to make any generalizations. We could, however, make conclusions within the context of the study because 7 out of 10 replied and 1 student didn't complete the course (or the survey) which makes the response rate 78%. A response rate of 78% seems to be an indication of validity but only seen in correlation with other sources of empiric data and only as an internal expression in the given case and context. The empiric data is strong enough to conclude something about learning and teaching within the study, though. While analyzing the data it became evident that it might be interesting to cross-tabulate a question from the survey on whether the student used computers growing up with the rest of the questions. This cross-tabulation became one of the focal points of the data analysis. We also made a cross-tabulation between age and the rest of the questions. There was a quite obvious convergence between age and usage of computers while growing up but the two cross tabulation reports were not entirely alike så we chose to maintain the two groups separately because they show different co-relations.

4.1 Findings

While analyzing the data we found that the students who didn't use computers in their childhood (33% of population) were more likely to prefer traditional, face-to-face teacher presentations and class discussion as opposed to video presentations and online discussions. In the survey one student from the demographic group who didn't use computer in their childhood put it this way: 'There is no one to talk to in the learning process', another student from the same demographic said: 'I need someone to talk to, to discuss with; discussion is important for me to learn new'. The students from this demographic watch each video clip more than three times average (6 times max) and they respond that the possibility of watching video clip multiple times is very important. They also respond that it is very important that the video presentations are specific for the course and not generic video presentations. This indicates that they are not used to learning for YouTube or other video sites. The survey also showed that it is less important if the voice/face in the presentation is familiar.

The fact that they value the possibility to immerse themselves into the subject matter at their own pace (watching video clips 3-6 times) could be interpreted as an indicator for deep learning processes in this demographic group. This group also addresses the importance of note taking as an important interaction between watching the videos and learning from the videos.

The other group of students who did used computers in the childhood (66% of population) responds that they also learn from relevant non-course specific YouTube video clips but they learn more from the specific teacher produced video clips, though. They only watch the course specific video presentations twice (average). This could be interpreted as an indicator for surface learning processes in this demographic group. This group is younger than the other group and they have fewer indicators for deep learning. We deliberately chose to look for other factors than age because we didn't assume that it would be of significance (Rogers 2010). Furthermore age doesn't seem to affect the learners' ability to utilize the techniques needed for participating in the pedagogic design;

however, the age of the student might affect the level of deep learning. It might also affect the study techniques that they apply.

Most importantly 40% of the whole population responds that they learn more for the teacher produced video presentations and etivities then from traditional face-to-face teaching.

Initially we thought that recognizable voice and face in the video clips would be regarded as important but only 40% regard that factor as important. So, it is really vital that the video clips are specific and entirely relevant to the learning goals but the phatic function in the video clips is not that important. If that is valid on a larger scale it indicates that you can make course specific video clips and share them amongst teachers without alienating the students. However, we are still going to focus on personally produced video clips because then the teachers will become experienced and confident in producing own video material and they will not be depending on others to produce video clips in other contexts which in turn will make it easier to develop and implement new etivities.

In the forum discussions we found that although 60% are very positive towards discussing in the online forum only 20% feel that they have learned a lot from other students replies to their posts. We still claim it is an OSLS because 100% (50% very often, 50% often) say that they learn from reading other students replies to main topic. The students also say that they learned a lot (40% very often, 60% often) from writing own replies to main topic. In the open ended question they reply (translated from Danish):

Student 1: “I often need to think carefully about things and that is possible here (online forum)”

Student2: “I’m getting a more clear sense of the subject matter, more words to explain”

Student 3: “Written replies are often more well considered and in depth that a spoken answer”

The students highlight that you can watch videos as many times as you need and the fact that you have time to formulate your reply as positive elements in this pedagogic design. This indicates that the pedagogic design caters for deep learning (Offir, Lev et al. 2008) rather than surface learning. In an open ended question a student writes (translated from Danish):

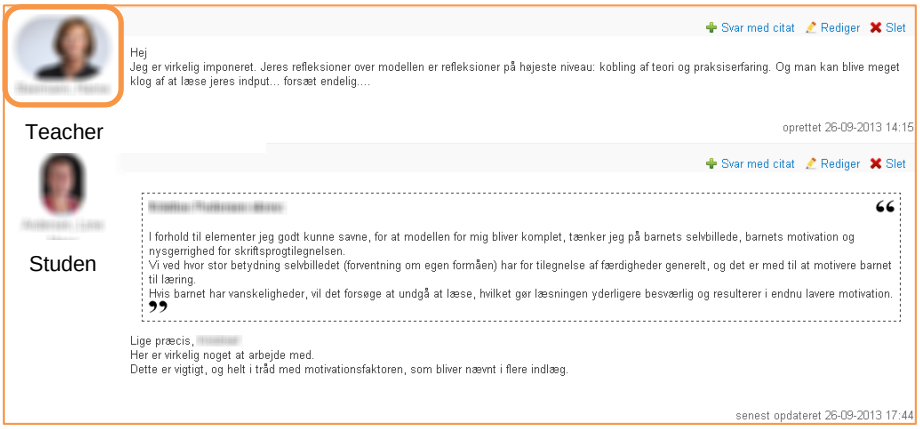
”The fact that I can watch the video multiple times and don’t need to take notes (first-up) but can have full attention on the video. It is important, though, to have a print of the synopsis so that you can take notes. In traditional teaching you have to take notes and listen at the same time and then I forget what the teacher said” (Student)

This indicates that this particular student is very aware of her learning process. She has a robust strategy for learning that prompts her to ad personal study skills to the learning materials provided by the teacher. She belongs to the demographic group that didn’t use computers while growing up. The question is then; how can more students adapt her approach to learning? In this case crossing age with the other questions might be interesting because that would open the possibility to gain information on which type of school (Danish system) the student attended in their childhood; reform (post 1975) or traditional (pre 1975). The younger demographic (44 years and younger) watch the video clips twice whereas the older demographic (44 years and older) watch the video clips up to 6 times. The older demographic group is properly more used to expressing themselves through written language than the younger demographic group. Furthermore they posted fewer but longer posts than the younger demographic group. The question of the students age and school history, might be interesting to investigate in a study on adaptive e-learning and learning analytics but in this study we just saw indications that it might be interesting to study further.

4.2 Discussion of findings

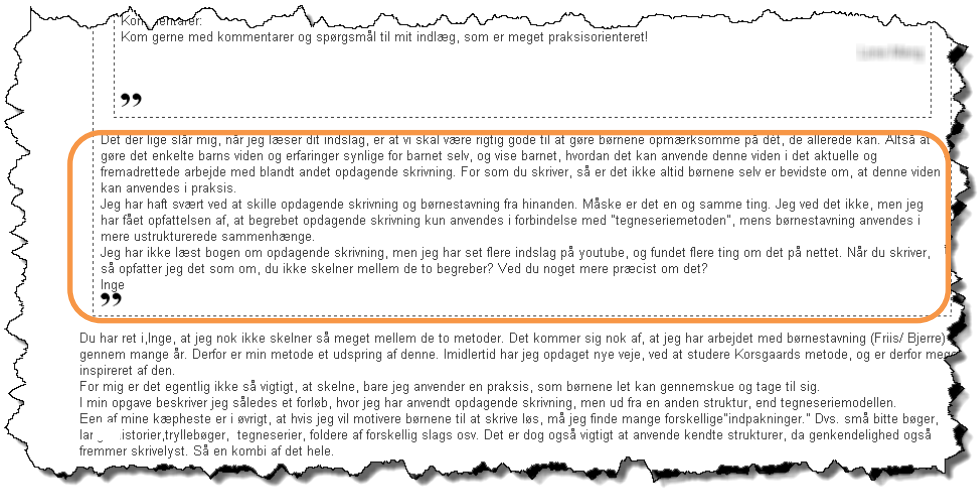
When is the constitution of the OSLS successful? Is it when the students feel that they gain something from each other's posts in the online discussion? Or when a discussion thread evolves into something else? Or when a discussion thread generates a learning spiral that elevates the students' level of knowledge in a common process? Our initial hope was for the latter.

Analysis of the online discussions show that students wait for the teacher to comment or moderate before they start quoting each other. In the example below the students post 5 replies to the teachers question before the teacher comments. She says: "I'm really impressed. Your reflections are on a really high level in regards to crossing between theory and practice. And you really get wiser reading your input…do continue." Right after the teachers encouraging comment, the students gain confidence to comment each other's posts. It tells us that the phatic function in the utterances is really important (Gerbic 2010) for the OSLS to come into existence.



Figur 1 Excerpt from online discussion

In the first couple of discussions the visibility of the teacher seems very important as does the phatic character of the teacher's comments. Our study doesn't show whether it is the mere visibility of the teacher or it is the phatic character of her comment that triggers the other comments. In later discussions the students comment each other more freely and the OSLS takes shape:



Figur 2 Excerpt from discussion

One student quotes another student, who is quoted by a third student. The second student (highlighted) says: "It just strikes med when I read your post that…". The third student replies: "You

are completely right, ‘name of student’, I properly don’t separate the two methods…”. In this case the teacher is not visible in the discussion, the students are doing the 4th etivity in the course and they know how to use the online discussion and they have gained a sense of academic terminology, which means that they can start to participate and reify in the OSLS. The technology, the terminology, the teacher produced video clips and the online discussions have become part of their common repertoire (Wenger 1998). During the first and second etivity the students were building the common repertoire and they really needed the teacher’s guidance for that.

On the basis of our empiric data and the analysis of that data we can identify a set of circumstances that appears to be important for the OSLS to be successful in this specific context.

The students seem to need:

- Something of interest to participate with within the field of the subject matter.
- Foundation for formulating open, relevant questions within the field of the subject matter.
- Knowledge of terminology within the field of the subject matter.
- An understanding of the importance of; posting questions, posting clarifying questions and posting answers.
- An understanding of the phatic function of language in the discussion.

The teachers seem to need:

- A strong strategy for keeping the discussion alive (visibility, phatic comments).
- An understanding of the importance of the phatic function in both video clips and in comments to the online discussions.
- An understanding of the importance of the technological simplicity and robustness of the technologies applied to the pedagogical design.
- An understanding of the students’ progressive development of skills while learning in an unfamiliar setup.
- An understanding of the importance of gradually increasing the complexity of the utilization of the technologies.

Our study show that technical problems were the most common and severe hindrance for learning. We suggest that some sort of tech-steward-role (Wenger, White et al. 2009) is implemented in the OSLS.

5.0 Conclusion

We were interested in studying co-creation of knowledge through a common learning process that we called an OSLS. The common learning process consisted of a body of individual learning processes that fed each other with questions and answers about the content of the teacher produced video clips and the appointed literature. We found that if the video clips are relevant and have a phatic twist then some students believe that they learn more from this pedagogic design than they would have from more traditional teaching. Those students appear to engage in deep learning processes (Offir, Lev et al. 2008). The interesting question to ask might then be; which circumstances will catalyze deep learning in an OSLS. Offir , Lev and Bezale utilize a model (Entwistle, Waterston 1988) that stratifies learning into ’deep’ and ‘surface’ learning. The model states that deep learning happens when the student:

-Creates new information from information that was collected, using hypotheses and quotes
-Proposes one or more solutions in terms of judgment
-Assumes advantages and disadvantages for a situation or solution
(Entwistle, Waterston 1988, Offir, Lev et al. 2008).

We found all of the above in the online discussions but it would demand more empiric data to conclude whether the deep learning characteristics predominantly apply to the older demographic group.

We also found that the phatic function was important in discussion and not so much in the video clips. So, we conclude that the combination of relevant, course specific video clips in conjunction with online discussions is a good pedagogic design. The teacher needs to focus on phatic language in his/her comments to motivate the OSLS. It looks as if the OSLS is also depending on the teachers' questions to be open and inclusive. If the teacher asks questions that can be answered by quoting names and numbers then the discussion will properly not live long but if the teacher asks questions like; 'How could this theory be used in your practice?'. Then it would be open to all students to answer.

We suggest more focus on setting framework for replying on other students in order for the student to student discussion to become more fruitful.

We also discussed whether the course should be adaptive to student demographics in the sense that the initial background survey would determine which video clips (differing in longevity) and which activities the students should participate in but we need more data to conclude on that.

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